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GROUP 1700

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Application of: Glenn E. Land

Application No. 10/086,554

Filed: March 4, 2002

For: POINT OF USE WATER PURIFICATION
METHOD AND APPARATUS

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) Group Art Unit 1764
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) Examiner: Manoharen
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)
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RESPONSE TO RESTRICTION REQUIREMENT

Honorable Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

Responsive to the Office Action dated April 18, 2003, applicant hereby
elects the claims of Group I, including claims 1-21.

This election is made without traverse.

Respectfully submitted,
JONES, TULLAR & COOPER, P.C.

By: 

George M. Cooper
Reg. No. 20,201

JONES, TULLAR & COOPER, P.C.
P.O. Box 2266 Eads Station
Arlington, VA 22202
(703) 415-1500
May 15, 2003

[0088] Figs. 15-17 are partial top and left and right side views with selected portions removed of another embodiment of the distiller of the invention, wherein the various components are configured to provide a low profile, compact continuous flow distiller unit 500 suitable for use, for example, on a counter top.

[0089] In this embodiment, the distiller includes the various components described above with respect to Figs. 1 and 14, and such components are similarly numbered for convenience, although it will be understood that the details of component shapes may vary from those previously illustrated.

[0090] The unit 500 includes a housing 502 surrounding the boiler 42 and condenser 68, and providing a front recess 504 for receiving a reservoir 82. The housing carries a hinged lid 506 which is mounted on the housing by a hinge 508 and which extends over the reservoir 82. The boiler 42 is removed from the illustration of Fig. 16, to show the relative locations of the filter 32 and the solenoid valve 36 with respect to the condenser 68, while the condenser 68 is removed from the illustration of Fig. 17 to show the relative locations of the liquid level control 40 and a boiler drain cup 509 with respect to the boiler 42.

[0091] In the counter top configuration illustrated in these figures, a float switch 510 may be secured to the hinged cover 506 to detect when the reservoir 82 is full, and a safety switch 512 may be located on the housing 502,

preferably in recess 504, to detect the presence or absence of the reservoir.

These two switches 510 and 512 preferably are connected to the control circuit 112 to shut off power to the heater in boiler 42 when the reservoir is not in place or when the reservoir is full.

[0092] As illustrated in Fig. 17, the boiler 42 may be enclosed in an insulating blanket or layer 514 to increase the efficiency of the device. It is also noted that in this embodiment, as in all the others described herein, at least a portion of the housing is removable to provide access to various distiller components for service and maintenance. In the configuration of Figs. 15-17, some of the components are accessible through the hinged lid 506. It will also be understood that more than one pitcher or bottle (reservoir) may be provided so a full one can be placed in a home refrigerator while another one is being filled. In this way a continuous supply of pure chilled drinking water is always available.

[0093] Another distillation apparatus according to the invention is generally indicated diagrammatically at 520 in Figs. 18 and 19 as a portable batch distiller which includes a base housing 522 having side walls 524 and 526, a back wall 528 and a bottom wall 530 with feet 532. An insulated boiler pocket 534 is mounted in housing 522 to receive a removable, open-top boiler 536 having side walls 538 and bottom wall 540. Boiler 536 receives raw water 542 to be heated. A hot plate 544 is provided in the bottom of pocket 534 to

heat the raw water for producing vapor in a vapor chamber 546 above the surface of the water. A heat sensor 546 is provided for shutting off power to hot plate 110 when a predetermined increase in temperature is sensed.

[0094] The housing includes, in this embodiment, a top, or cover portion 550 having side walls 552 and a top wall 554 which is removable from base housing 522 for providing access to boiler 536 to fill it with the raw water 542 and for removing the boiler for easy cleaning or replacing. Mounted within top housing 550 is a condenser 560 for condensing vapor from chamber 546 into pure water, a fan 562 for cooling the condenser 560, and a lid 564 for sealingly closing boiler 536 when top housing 550 is placed in position on top of base housing 522. Lid 564 incorporates a vapor port 566 which is operably attached to condenser 560 by vapor tube 568.

[0095] A carbon filter 570, for enhancing the taste of purified water flowing from condenser 560, has an inlet 572 removably attached to a distillate outlet 574 of condenser 560, and has an outlet 576 for delivering filtered water to a bottle or pitcher 580 which is removably positioned on a portion of the housing bottom wall 530 below carbon filter 570.

[0096] In operation of the batch distiller 520, a predetermined volume of raw water 542 is introduced into boiler 536 and top housing 550 is placed in position on top of base housing 522. Water 542 is heated by hot plate 544, which produces vapor in chamber 546. The vapor rises into the condenser 560

by way of vapor port 566 and tube 568, where it is condensed into pure water. The pure water flows by gravity from condenser 560, through removable carbon filter 570, and into bottle 580. The end of production of pure water is controlled by the heat sensor 546, which senses a rise in temperature to shut off power to the hot plate.

[0097] Still another embodiment of the distiller of the present invention is in the form of a new compact consumer appliance, illustrated at 600 in Figs. 20, 21 and 22, which may be configured for installation under a counter in similar manner as a compact dishwasher or trash compactor, preferably is narrow and deep to minimize the space required. The under-counter distiller unit 600 incorporates many of the components described above with respect to Figs. 1-4, and similar components are similarly numbered for convenience. Thus, the unit 600 includes a boiler 42, and a condenser 68 cooled by a fan 70 connected by line 64 to receive vapor from the boiler. Water is supplied to boiler 42 from inlet line 30 through prefilter 32 and solenoid valve 36, and the level of water in the boiler is controlled by a level sensor 40.

[0098] These components are mounted on a support platform 602 secured in a narrow, deep housing 604 which may, in turn, be mounted on suitable rollers 606 in a roller housing 608. The roller housing positions the distiller unit at its desired location, under a counter 610, for example, while the rollers allow it to be moved forwardly out from under the counter, for access to the

components for servicing and replacement.

[0099] Also located in housing 604, beneath the support platform 602, is the reservoir 82, which receives distilled water 612 from the condenser 68 by way of filter 86. A pump 90 delivers water from the reservoir, upon demand, to a sink faucet, refrigerator ice maker, or to other locations, under the control of the control circuit 112, described above, which may be powered by a suitable power source through cord 618. To permit cleaning or replacement of the boiler 42, the boiler drain line 204, described with respect to Fig. 5, is connected through a valve 206 to a drain cup 620 supported in housing 604, for example, on a platform 622. This drain cup may be reached through a suitable access panel in the front or side of housing 604.

[00100] Air flow through the distiller housing is by way of a replaceable air inlet filter 630, which preferably is mounted in an opening 632 in the front of housing 604, and air vents 634 at the top of the housing. The filter provides the dual purposes of protecting internal components from dust and of purifying the ambient room air.

[00101] Figs 23, 24 and 25 illustrate at 650 a further modification of the distiller of the invention, suitable for use under a kitchen sink, or similar location. The under-counter distiller unit 650 incorporates many of the components described above with respect to Figs. 1-4, and similar components are similarly numbered for convenience. Thus, the unit 650 includes a boiler

42 and a condenser 68 cooled by a fan 70 connected by line 64 to receive vapor from the boiler. Water is supplied to boiler 42 from inlet line 30 through prefilter 32 and solenoid valve 36, and the level of water in the boiler is controlled by a level sensor 40.

[00102] These components are mounted on a support platform 652 secured in a shortened housing (not shown) to enable it to be mounted in a small area such as that typically found under a kitchen sink. The distiller may be mounted on suitable rollers in a roller housing to position the distiller unit at its desired location while allowing it to be moved forwardly out from under a sink, for access to the components for servicing and replacement, as described above.

[00103] Located beneath the support platform 652, is a foreshortened reservoir 654, which receives distilled water from the condenser 68 by way of filter 86, as previously described. A pump 92 delivers water from the reservoir, upon demand, to a sink faucet, refrigerator ice maker, or to other locations, under the control of the control circuit 112, described above. To permit periodic partial draining of the boiler 42, the boiler drain line 204, described with respect to Fig. 5, is connected through a valve 206 to a drain cup. This drain cup may be reached through a suitable access panel in the front or side of the distiller housing.

[00104] Air flow through the distiller housing is by way of a replaceable air

inlet filter, which preferably is mounted in an opening in the front of the housing, and air vents at the top of the housing. The filter provides the dual purposes of protecting internal components from dust and of purifying the ambient room air.

[00105] Although the present invention has been described in terms of preferred embodiments, it will be apparent to those of skill in the art that numerous modifications and variations may be made without departing from the true spirit and scope thereof as set forth in the accompanying claims.

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